

APPENDIX D

PALEONTOLOGICAL RESOURCE AND MONITORING ASSESSMENT

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6 May 2010

Mr. Alex H. Jewell
RBF Consulting
9755 Clairemont Mesa Boulevard, # 100
San Diego, California 92124

Subject: Paleontological review and resource and monitoring assessment, new San Diego Central Courthouse project, downtown San Diego, San Diego County, California

Dear Mr. Jewell:

A paleontological review, including paleontological resource and monitoring assessments, has been completed for the new San Diego Central Courthouse project site in downtown San Diego, San Diego County, California (Attachments 1 and 2). The proposed project involves demolition of pre-existing structures on the site, excavation for two levels of underground parking, and construction of an approximately 17 story courthouse building. A tunnel will also be excavated that will connect the new courthouse with the existing ("new") County Jail, as well as additional trenching for relocating existing utility lines, although these are not specifically located on existing site plans. The 1.4 acre courthouse site is owned by the Judicial Council of California.

Location

The general location of the proposed new San Diego Central Courthouse project site is shown on Attachment 2, on the U. S. Geological Survey 7.5-minute, 1:24,000 scale, Point Loma, California, topographic quadrangle, in unsectioned pueblo lands of the City of San Diego. More specifically, the project site encompasses the entire city block bounded on the north by B Street, on the south by C Street, and on the west and east by State and Union Streets (Attachment 3). In addition, the project calls for a new tunnel to connect the new courthouse with the existing San Diego County Jail, currently located between B and C Streets and Front Street and First Avenue.

Basis of assessment

The paleontological assessment herein is based on the most recent published geologic map of the downtown San Diego area (Attachment 4, after M. P. Kennedy, 1975, pl. 3A), subsurface geologic reevaluations of the downtown area based on new stratigraphic and

paleontological data derived from numerous newly excavated building sites over the last 12 years, unpublished paleontological monitoring reports for these projects, and analyses of the museum collections themselves. Most of the unpublished reports were written by staff paleontologists of Brian F. Smith and Associates, Inc. (BFSI), in Poway, and the Department of Paleoservices at the San Diego Natural History Museum. The fossil collections made during paleontological monitoring and mitigation programs for downtown San Diego construction projects are currently deposited in three California museums, the San Diego Natural History Museum in Balboa Park (SDNHM), the Natural History Museum of Los Angeles County in Los Angeles (LACMNH), and the University of California Museum of Paleontology in Berkeley (UCMP). Additional specimens have also been deposited in the U. S. National Museum of Natural History (Smithsonian Institution), in Washington, D.C. Collections data are available, at least in part, via the internet for the three California institutions. These represent at least 60 different construction projects and probably 75 or more institutional locality collections. The only published summary of these recent investigations is by G. L. Kennedy and I. D. Browne (2007).

Geologic setting

The most recently published geologic map of the downtown San Diego area (Attachment 4, as shown on the Point Loma 7.5' quadrangle by M. P. Kennedy, 1975, pl. 3A) assigns most of the downtown area to the upper Quaternary (upper Pleistocene) Bay Point Formation ("Qbp"). Much of Cortez Hill and eastward, in the vicinity of San Diego City College, is assigned to the middle to upper Pliocene San Diego Formation ("Tsd"). Areas along the waterfront of San Diego Bay are shown as artificial fill ("Qaf"), but these surficial sediments overlie fossiliferous sediments of the Bay Point Formation at shallow depths. As reinterpreted by Kennedy and Browne (2007), the Bay Point Formation is more properly restricted to estuarine-marine sediments deposited during the sea level highstand of the last interglacial period and thus dating to the period around 120,000 years before present (BP). The Bay Point Formation is thus correlative with outer coast depositional events on the Nestor Terrace, which was eroded into the then existing shoreline during the same sea level highstand (*cf.* T.-L. Ku and J. P. Kern, 1974; D. R. Muhs *et al.*, 1994). The shoreline for the 120,000 year sea level highstand, which was originally about 20 feet higher than modern sea level, has been identified in three project sites in the East Village area by Kennedy and Browne (2007), as well as below Horton Plaza (SDNHM collection records), and northwestward into the Little Italy area (unpublished data). The Central Courthouse project site is west (seaward) of the late Pleistocene shoreline and thus would be expected to overlie subsurface exposures of the 120,000 year BP Bay Point Formation in its restricted sense. The existence of Pliocene sediments of the San Diego Formation in the subsurface at the project site is believed to be too deep, if present, to be encountered during any excavation activities onsite.

The Bay Point Formation, however, is not the only fossiliferous marine Pleistocene unit in the downtown area. T. A. Deméré (1981) and T. A. Deméré and D. W. Streiff (1982) were the first to recognize that marine faunas older than those of the Bay Point Formation existed in the subsurface sediments in the downtown San Diego area, as well in the northern Point Loma area and in southeast San Diego. They proposed the name

“Broadway fauna” for their newly recognized assemblages, based in main part on collections recovered from a sewer main trench down Broadway near its intersection with Second Avenue (Deméré, 1981, table 1; D. L. Elder, 1982, table 2). However, the type “Broadway fauna” of Deméré (1981) was based on a composite collection from two distinct stratigraphic units that were subsequently distinguished and informally referred to as the “upper Broadway” and “lower Broadway” faunas or faunal horizons by Kennedy and Browne (2007). The two marine units are separated by a paleosol developed upon the lower (“lower Broadway”) unit, indicative of an appreciable period of subaerial exposure (and soil development) prior to the subsequent marine inundation associated with deposition of the “upper Broadway” unit. Based on our knowledge of the timing and magnitude of interglacial sea level highstands during the last million years, we can assign middle Pleistocene ages of ~ 330,000 years BP and ~ 405,000 years BP, respectively, to the “upper” and “lower Broadway” stratigraphic units and their contained faunas (Kennedy and Browne, 2007). Fossiliferous exposures of these two middle Pleistocene units have been described from building excavations in the CCDC Little Italy (and nearby Cortez Hill), Columbia, Core, Marina, Gaslamp Quarter and East Village subareas of downtown San Diego (SDNHM, LACMNH and UCMP collections).

Paleontological resource sensitivity

The paleontological resource sensitivity of an area is based on a number of criteria, including the proximity to previously recorded fossil localities, and the presence of geologic units (formations) known to be locally fossiliferous. Unpublished administrative guidelines for assigning sensitivity rankings to sedimentary units in the City and County of San Diego have been proposed and are presented by T. A. Deméré and S. L. Walsh (1993), the City of San Diego (2002), and the County of San Diego (R. Stephenson *et al.*, 2007). In these, the local sedimentary formations are generally given identical “paleontological resource potential” and “paleontological resource sensitivity” rankings, although in a few cases there are justifiable differences. For the downtown San Diego area, the Bay Point Formation is given a High Paleontological Resource Sensitivity / Resource Potential ranking in all three guideline reports, indicating the need to implement mitigation measures in order to prevent the potential loss or destruction of significant nonrenewable paleontological resources present in this sedimentary unit. The two older, middle Pleistocene, sedimentary units (“upper” and “lower Broadway”) are not specifically addressed in the guideline reports cited above, but never-the-less have produced such an abundance of fossiliferous materials (*cf.* Kennedy and Browne, 2007; and SDNHM, LACMNH and UCMP collection records) across downtown San Diego that they must also be accorded a High paleontological resource sensitivity and High paleontological resource potential ranking equivalent to that of the younger Bay Point Formation.

Records search results – fossil localities

An inhouse paleontological literature and collections and records review conducted by BFSa did not reveal any recorded fossil localities from the project site. Because very few fossil localities were previously recorded from downtown San Diego before the redevelopments of the early 1980s (*e.g.*, the Horton Plaza redevelopment), or again in the latest 1990s and early 2000s (redevelopment of the East Village area in conjunction with

construction of Petco Park), this was not unexpected. However, the abundance of fossil localities discovered and collected during these periods of redevelopment have produced a wealth of mainly unpublished information on the stratigraphy and fossil record of the downtown San Diego area. More than 75 fossil localities or fossil collections can now be documented from the downtown area. These represent the 120,000 year old Bay Point Formation, the ~ 330,000 year old “upper Broadway” and ~ 405,000 year old “lower Broadway” sedimentary units, and the ~ 2 to ~ 4 million year old San Diego Formation. In the vicinity of the project site, fossil localities represent the Bay Point Formation and the “upper” and “lower Broadway” sedimentary units. All have yielded rich marine invertebrate faunas, in addition to rare marine and terrestrial vertebrates (*cf.* Kennedy and Browne, 2007).

Conclusions and recommendations

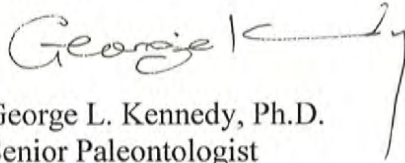
The SDNHM and LACMNH collections and records document the presence of highly fossiliferous marine sediments, and the high potential for them to contain significant nonrenewable paleontological resources (*i.e.*, fossils), particularly of marine invertebrates, some of which are extinct species. These sedimentary units are therefore assigned a high paleontological resource sensitivity. As a result, a Mitigation, Monitoring and Reporting Program (MMRP) should be implemented in which full time paleontological monitoring of excavation, tunneling and trenching activities in the fossiliferous formations are recommended to mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources (*i.e.*, marine invertebrate and marine and terrestrial vertebrate fossils). At a minimum, the MMRP should consist of those procedures outlined on page 7, following. The implementation of these monitoring and mitigation measures is regarded as sufficient to reduce any adverse impacts to any potential nonrenewable paleontological resources to a level below significant.

Summary

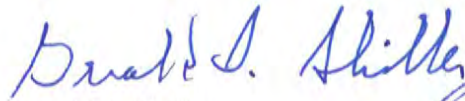
The downtown San Diego area has a well documented record of producing abundant marine invertebrate fossils and less abundant marine and terrestrial vertebrate fossils from sediments that range in age from ~ 120,000 years BP to as much as ~ 4 million years BP. Abundantly fossiliferous sedimentary units in the vicinity of the new San Diego Central Courthouse project site include the upper Pleistocene Bay Point Formation, and the middle Pleistocene “upper” and “lower Broadway” units. Because of the importance of these documented fossiliferous formations, a Mitigation, Monitoring and Reporting Program (MMRP) must be implemented in order to reduce any adverse impacts to potential nonrenewable paleontological resources to a level below significant. The MMRP must be consistent with the provisions of the California Environmental Quality Act (CEQA), regulations currently implemented by the City and County of San Diego, and the proposed guidelines of the Society of Vertebrate Paleontology. At a minimum, the MMRP should consist of those procedures outlined on page 7, following. The implementation of these monitoring and mitigation measures are regarded as sufficient to reduce potentially adverse impacts to any nonrenewable paleontological resources to a level below significant.

Thank you for the opportunity to have provided paleontological services on this project.
If you have any questions, please feel free to contact us at our Poway address.

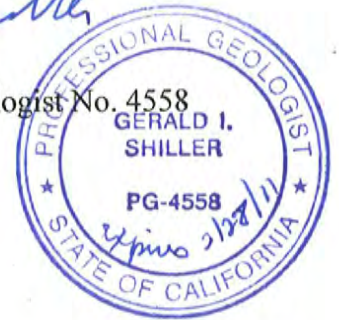
Sincerely,



George L. Kennedy, Ph.D.
Senior Paleontologist



Gerald I. Shiller
California Professional Geologist No. 4558



Attachments: Index maps, geologic map

REFERENCES

- Deméré, T. A. 1981. A newly recognized late [=middle] Pleistocene marine fauna from the City of San Diego, San Diego County, California. *In* Abbott, P. L., and O'Dunn, S. A., eds., *Geologic investigations of the San Diego coastal plain. Field trip guidebook prepared for San Diego Association of Geologists, Field Trip, April, 1981.* San Diego Association of Geologists, San Diego. Pp. 1-10, fig. 1, pl. 1, table 1.
- Deméré, T. A., and Streiff, D. W. 1982. Recognition of middle and upper Pleistocene marine deposits in downtown San Diego, California. *American Association of Petroleum Geologists, AAPG Bulletin*, 66(10): 1687.
- Deméré, T. A., and Walsh, S. L. 1993. Paleontological resources County of San Diego. Unpublished report prepared for the San Diego County Department of Public Works, San Diego, by the Department of Paleontology, San Diego Natural History Museum, San Diego. Pp. i-iii + 1-68, figs. 1-3, 8 maps.
- Elder, Dorian L. 1982. A critical examination and evaluation of the structure and stratigraphy in the downtown San Diego area, California. Unpublished M.S. thesis, Department of Geological Sciences, San Diego State University, San Diego. Pp. i-x + 1-151, figs. 1-10, pls. 1-7, tables.
- Kennedy, G. L., and Browne, I. D. 2007. Paleontology and geochronology of the middle and upper Pleistocene marine record in the downtown San Diego area, San Diego County, southern California. *Western Society of Malacologists, Annual Report*, 36: 13-34, fig. 1, tables 1-2.
- Kennedy, M. P. 1975. Geology of the western San Diego metropolitan area, California. Del Mar, La Jolla, and Point Loma quadrangles. Section A, Geology of the San Diego metropolitan area, California. *California Division of Mines and Geology, Bulletin* 200: 7-39, figs. 1-9, photos 1-8, pls. 1A-3A [map sheets, scale 1:24,000], table 1.
- Ku, T.-L., and Kern, J. P. 1974. Uranium-series age of the upper Pleistocene Nestor terrace, San Diego, California. *Geological Society of America Bulletin*, 85(11): 1713-1716, fig. 1, tables 1-2.
- Muhs, D. R., Kennedy, G. L., and Rockwell, T. K. 1994. Uranium-series ages of marine terrace corals from the Pacific coast of North America and implications for last-interglacial sea level history. *Quaternary Research*, 42(1): 72-87, figs. 1-16.
- Stephenson, Roberta, Giffen, J. H., and Gibson, Eric. 2007. County of San Diego guidelines for determining significance [for] paleontological resources. Unpublished report prepared by the San Diego County Land Use and Environment Group, Department of Planning and Land Use and Department of Public Works, San Diego. Pp. i-v + 1-46, figs. 1-10, table 1.

Paleontological Mitigation Program, proposed San Diego Central Courthouse

1. Monitoring of excavation and trenching activities in areas identified as likely to yield paleontological resources by a qualified paleontologist or paleontological monitor. Monitoring will be conducted in areas of excavation and/or trenching in undisturbed marine sediments of the upper Pleistocene Bay Point Formation and/or middle Pleistocene “upper Broadway” and “lower Broadway” formations, as well as where over-excavation of any thin veneer of younger alluvial sediments will encounter the Pleistocene marine sediments in the subsurface. Paleontological monitors will be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediment that are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface, or if present, are determined upon exposure and examination by qualified paleontological personnel to have low potential to contain or yield fossil resources.
2. Preparation of recovered specimens to a point of identification (*not* exhibition) and permanent archival conservation, including screen-washing of sediments to recover small invertebrates and vertebrates if appropriate. Preparation of individual vertebrate fossils, if recovered, will be more time consuming than for accumulations of marine invertebrate fossils.
3. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage (*e.g.*, the SDNHM, LACMNH or UCMP). The paleontological program should include a written repository agreement prior to the initiation of mitigation activities.
4. Preparation of a final monitoring and mitigation report of findings and significance, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location and stratigraphic context. The report, when submitted to the appropriate Lead Agency, will signify satisfactory completion of the project program to mitigate impacts to any paleontological resources.



Attachment 2

Project Location Map

New San Diego Central Courthouse Project

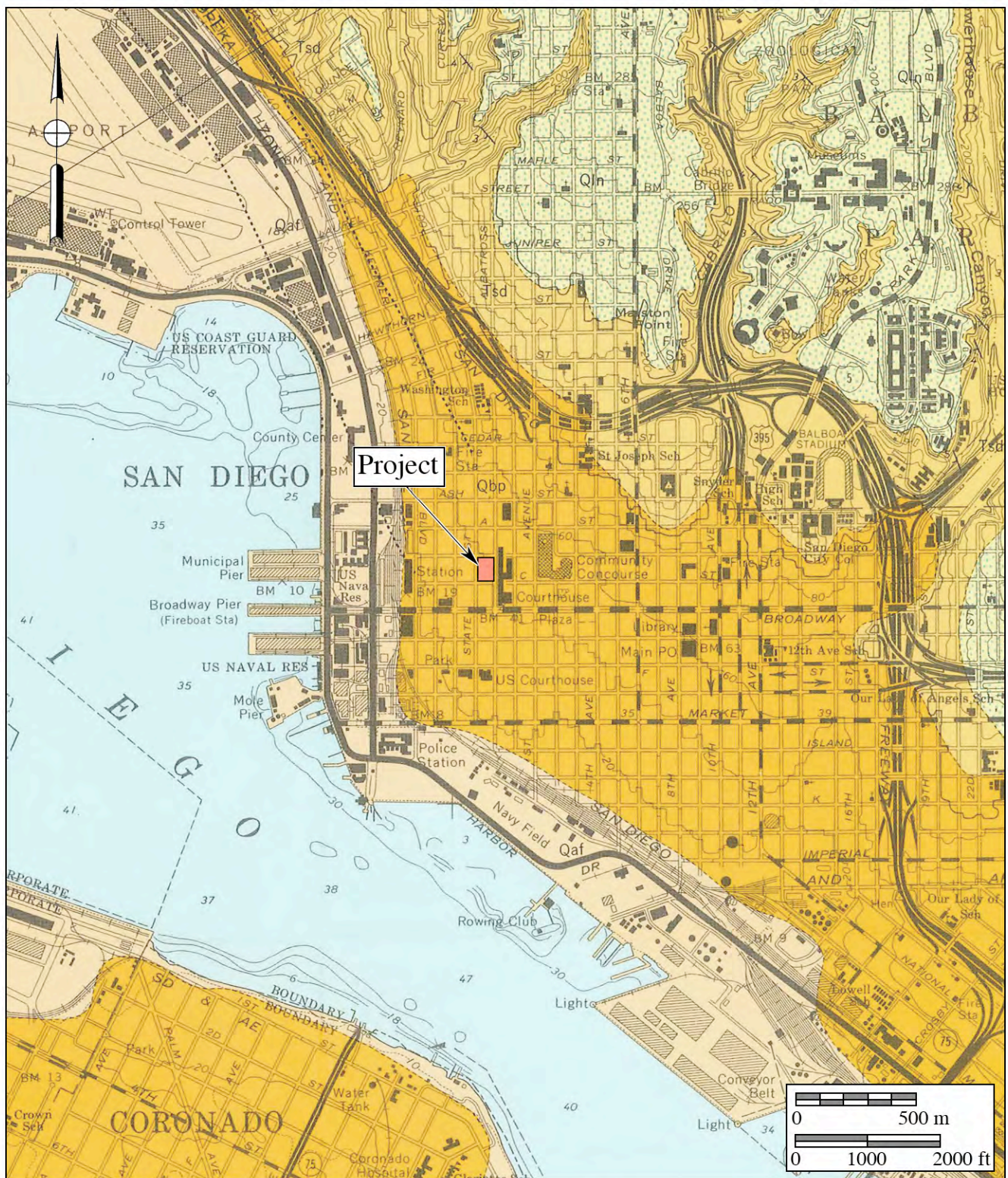
USGS Point Loma Quadrangle (7.5 minute series)





New San Diego Central Courthouse Project





Attachment 4

Geologic Map

New San Diego Central Courthouse Project

Geology after Kennedy, 1975



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